The Corps
of
Royal Canadian Electrical and Mechanical Engineers

No. 1 Base Ordnance Workshop
Royal Canadian Electrical and Mechanical Engineers
Annual Report
1944

The RCEME Heritage Archives

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Electrical and Mechanical Engineers
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Preface to the Digital Edition

This is a reproduction of the 1944 Annual Report of No. 1 Base Ordnance Workshop, Royal Canadian Electrical and Mechanical Engineers. The original copy of the report is in the EME Heritage Documents at the Canadian Forces School of Electrical and Mechanical Engineering.

This document includes all attachments to the original. I have carried out some minor editing for punctuation and spelling, to relate to for a modern audience. Additional explanations have been inserted in brackets [ ]. Photo captions are my best guess. Apart from that, this is their story in their words.

Doug Knight
January 2009

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Preface

This report is presented with a view to outlining the activities of 1 Canadian Base Workshop during the year 1944.

The unit exists for the purpose of repairing the equipment used by the Canadian Army in the United Kingdom and Europe, and such experimental work and special job programs as may, from time to time, be required.

It will be appreciated that any attempt to cover in detail such diversified activities would only result in a mass of information, which would tend to obscure the clarity of the picture. In view of this, the report has been catalogued, the pertinent facts outlined, and use made of comparative tables to accentuate points.

Units of the Royal Canadian Engineers (RCE) have, by their efficient efforts, contributed in no small manner in enabling the workshops to meet their expanding commitments. The extensive construction and maintenance, performed by the RCE, are apparent in the detail of this report.

Many helping hands have been extended by the various depots, shops, and other branches of the British Army. Of these, the local DCRE organization has been invaluable.

In like manner, many British civilian firms have placed at the disposal of this unit their accumulated wealth of technical assistance and knowledge.

For the purpose of rehabilitation, this unit has made a substantial contribution. Young men who, in many cases, entered the army without a trade, will be returned to civil life better equipped to foster the progress of the country at peace. Men of more matured years, who otherwise might have lost their skill, have had the opportunity to retain their proficiency and to further their knowledge.

This potential postwar position has been achieved by an energetic and progressive program of training, coupled with an appreciation of the problems of man-management.

It is hoped that this report may prove of value in outlining the position of the unit with respect to the Canadian Armed Forces.

Particular reference is made to the high degree of co-operation and whole-hearted interest that has been displayed by officers, non-commissioned officers (NCOs) and men. Sincere thanks are extended to all personnel for their efforts in attaining the aims of the unit.

(G.A. Secord)

Colonel,
Commanding Officer,
1 Canadian Base Workshop, RCEME

Organization & Personnel

The war establishment (WE) of 1 Canadian Base Workshop was increased in May 1944 to a strength of 3,110 all ranks. This was the third revision of the WE since mobilization. The increase was considered necessary to meet the estimated repair load of the Canadian Army under active conditions. The original WE (November 1941) contained 1,702 all ranks. The second (September 1943), which was based upon existing British base workshops, numbered 2,077 all ranks.

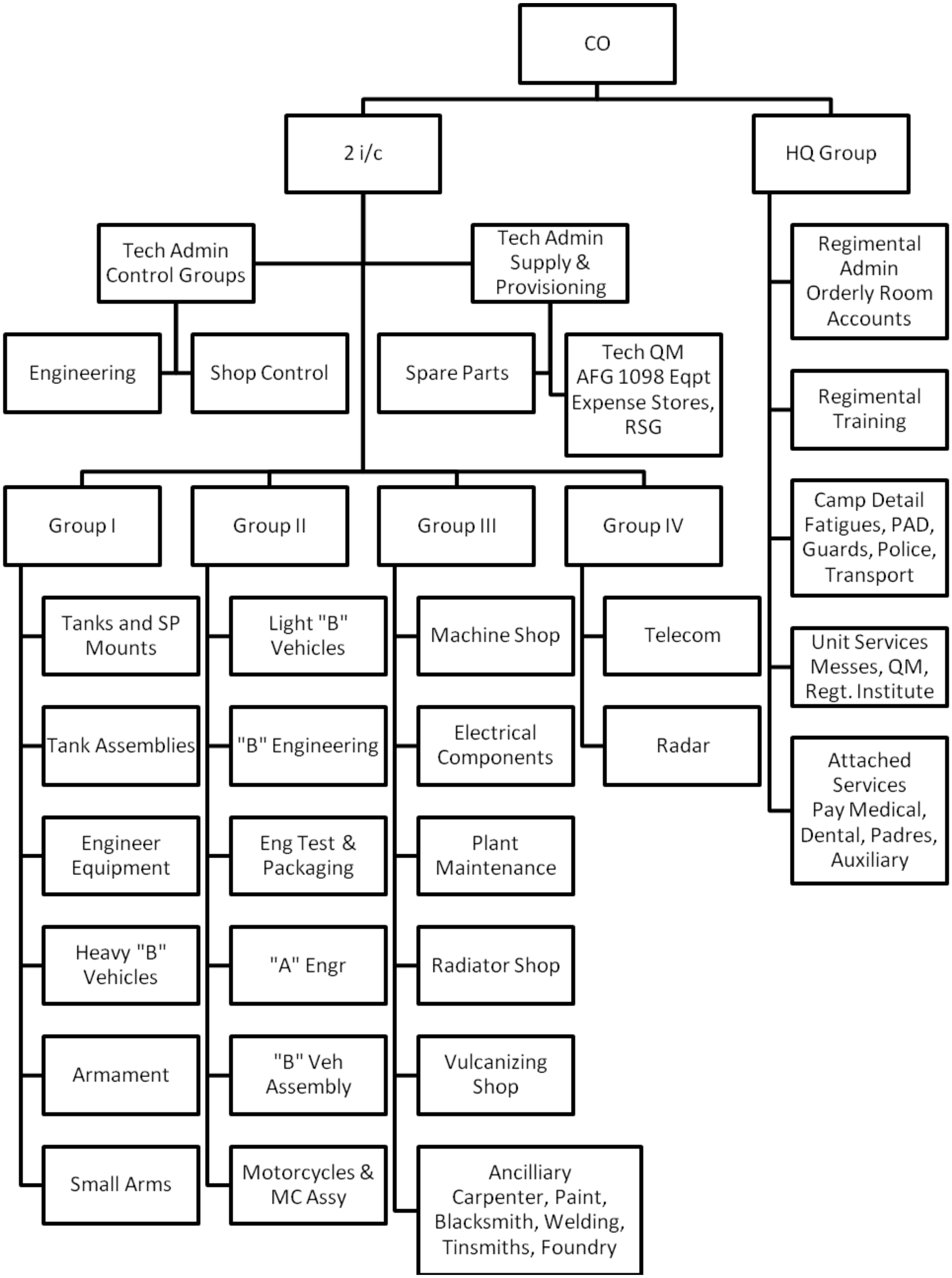
A summary of these three war establishments is shown in the table below:

	WE November 1941	WE September 1943	WE May 1944
Officers	58	41	56
Tradesmen	1,176	1,656	2,541
Non-Tradesmen	468	380	513
Totals	1,702	2,077	3,110

The unit strength at the beginning of 1944 was 1,868 other ranks and 143 attached. This remained constant until August at which time field and overseas RCEME establishments were up to strength. Available reinforcement personnel were then diverted to this unit. From August to October, there was a rapid expansion of both posted and attached personnel to a level of approximately 3,000. This figure did not vary appreciably for the remainder of the year.

Organization

Organization of the unit consists of four shop groups supported by technical and regimental administrative groups. Each shop group is comprised of a number of specialized and, wherever possible, related shops, provided with a small number of "overhead" personnel for internal administration. The administrative groups are responsible for general administration, provisioning, and planning. (See the organization chart below. [The original chart has faint handwritten additions, suggesting that it was used as a draft document for a possible reorganization. Because the writing is unclear and there is no context in the report, I have omitted these details. – ed])


CO
2 i/c
HQ Group
Tech Admin Control Groups
Tech Admin Supply & Provisioning
Engineering
Shop Control
Spare Parts
Tech QM AFG 1098 Eqpt Expense Stores, RSG
Regimental Admin Orderly Room Accounts
Regimental Training
Camp Detail Fatigues, PAD, Guards, Police, Transport
Unit Services Messes, QM, Regt. Institute
Attached Services Pay Medical, Dental, Padres, Auxiliary
Group I
Group II
Group III
Group IV
Tanks and SP Mounts
Tank Assemblies
Engineer Equipment
Heavy "B" Vehicles
Armament
Small Arms
Light "B" Vehicles
"B" Engineering
Eng Test & Packaging
"A" Engr
"B" Veh Assembly
Motorcycles & MC Assy
Machine Shop
Electrical Components
Plant Maintenance
Radiator Shop
Vulcanizing Shop
Ancilliary Carpenter, Paint, Blacksmith, Welding, Tinsmiths, Foundry
Telecom
Radar

Personnel Assessment

Instituted at the time of mobilization in Canada, the policy of carefully interviewing all newly-joined personnel in order that the pertinent facts relating to their civilian and army experience and training could be recorded, has proven sound. Such records were used as a guide in placing men at employment best suited to their abilities. The individual's desires in respect to the type of work in which he was interested were considered, and wherever practicable conformed with.

Attached personnel, possessing qualifications and experience not within the requirements of the unit, were placed at employment most closely related to their abilities.

Reinforcement Policy

In July, due to shortages and surpluses of various reinforcement tradesmen, a policy was adopted, whereby all un-posted RCEME reinforcements would be employed at these workshops. The purpose of this arrangement was to train as many personnel as possible in trades of which there were insufficient reinforcements, and to gainfully employ all un-posted trained men available, giving them practical experience prior to their despatch to operational theatres. Responsibility was assumed by the unit for the assessment of these personnel. A large number of fully trained and experienced reinforcements were sent on drafts from our posted strength, and untrained attached reinforcements posted in their place.

This policy presented some difficulties and required considerable effort to maintain the required flow of repaired work as well as to instruct the inexperienced personnel. Nevertheless, it was sound and reduced the possibilities of tradesmen being sent to the field who were neither capable nor experienced.

The attitude of the personnel toward these policies was very good. The attached reinforcement personnel were happy because they were employed on productive work and they could see the results of their assisting efforts. Trained personnel on strength, realizing that they were available for field drafts, were content knowing that the opportunity existed for them to be posted overseas.

Technical Training

This unit has always devoted a considerable amount of time and effort in training tradesmen, both for initial qualification in a trade and for upgrading in trade pay. At the time of mobilization, the availability of certain specialized trades was limited. Even the special recruiting campaign failed to meet the needs. It was, therefore, decided to accept potential tradesmen for the shops and to set up classes of instruction. Personnel with good civilian background were able to qualify; others required further training at army schools of instruction.

With the adoption of the reinforcement policy, it was necessary to expand this training program, particularly in the vehicle trades. Classes were conducted both during the day and evening, the personnel attending doing practical work in the shops, and receiving lectures and demonstrations in the classrooms.

As a result of this training program, 453 personnel qualified during 1944. A further 908 were upgraded. At the end of the year, there were 2,184 personnel on strength drawing trade pay. Approximately 95% of the personnel employed in the workshops were qualified and in receipt of trade pay, where vacancies permitted.

Category Personnel

The percentage of category personnel in relation to the total strength of the unit rose from 10% at the beginning of 1944 to 30% at the end of the year. Of this increase, 300 were general duties personnel received from infantry, in exchange for a like number of field category men from this unit. Also 300 category tradesmen were received from RCEME reinforcements and re-musters from other corps. The remainder, approximately 100, were lowered categories of personnel within this unit.

Dealing with this number of category tradesmen proved to us that we can absorb only a limited number with PULHEM profiles of P-4 and L-4. [The Canadian Army adopted the PULHEMS system of personnel evaluation in May 1943. It was intended to give a quick picture of each man's physical capabilities for specific tasks. "PULHEMS" was a word coined from the initials of the seven human factors which it described: "Physique," "Upper body and limbs," "Locomotion and lower limbs," "Hearing," "Eyesight," "Mentality," and "Emotional Stability." – Ed] This is because of the limited number of sedentary shop duties and the difficulty of employing such category personnel on work involving considerable physical exertion or standing on concreted areas for an entire day. Similarly, those with PULHEM profiles of M-4 and S-4 present the problem of providing sufficient supervision.

Remustering

The re-mustering of tradesmen from other corps presented difficulties only where the tradesmen possessed qualifications not within the RCEME list of trades. It was necessary, in some instances, to cease trade pay of such personnel, as no suitable allied trade vacancy existed within the unit war establishment.

The personnel situation in 1944 was a decided improvement over 1943, particularly towards the end of the year. A good nucleus of key personnel is available, and no difficulties can be visualized in continuing with the existing policies of supplying reinforcements for field drafts, and absorbing inexperienced personnel as well as certain types of category tradesmen.

An analysis of personnel turnover is shown in the table below. This deals only with postings to and from the unit and does not take into consideration the continuous turnover of attachments.

Owing to insufficient records being retained during 1944 for attached personnel, only an estimate can be made, this being 1,100 throughout the year. Of these, approximately 30% were eventually taken on strength, the remainder being sent for drafts and re-mustering to infantry.

Strength Analysis for 1944 (Other Ranks)								
Trades	Strength at beginning of year	Taken On Strength and/or qualified	Total Personnel Available	Struck off Strength			As At End of Year	
				To Hospitals and NETD	For Drafts and Re-musters	Total Struck off Strength	Strength	War Establish-ment
Armament Artificers - AA	1		1				1	1
Armament Artificers - AFV	4		4	1	3	4		9
Armament Artificers – Electrical		1	1		1	1		8
Armament Artificers – Field	1	12	13	2	4	6	7	10
Armament Artificers – Instrument (AA)	1	2	3	1		1	2	3
Armament Artificers – Instrument (Field)	2	9	11	4	3	9	2	7
Armament Artificers – MV	5	2	7	1	3	4	3	13
Armament Artificers – Radar	7		7		7	7		3
Armament Artificers – Wireless	1	12	13	1	8	9	4	8
Armourers	17	41	58	8	7	15	43	40
Blacksmiths	45	22	67	12	10	22	45	49
Carpenters	34	25	59	9	9	18	41	30
Draughtsmen (mechanical)	7	2	9		3	3	6	7

Strength Analysis for 1944 (Other Ranks)								
Trades	Strength at beginning of year	Taken On Strength and/or qualified	Total Personnel Available	Struck off Strength			As At End of Year	
				To Hospitals and NETD	For Drafts and Re-musters	Total Struck off Strength	Strength	War Establish-ment
Driver Mechanics	37	81	118	9	34	43	75	22
Electricians	37	122	159	20	5	25	134	142
Fitters	65	150	215	32	16	48	167	167
Fitters AFV	69	229	298	26	107	133	165	290
Fitters MV	149	219	368	54	23	77	291	249
Grinders Precision	17	12	29	4		4	25	45
Instrument Mechanics	30	47	77	10	4	14	63	43
Machinist Metal	62	45	107	18	2	20	87	96
Machinist Wood	11	13	24	2		2	22	15
Motor Assemblers	89							
Motor Mechanics	218	168	386	72	6	78	397	603
Millwright	1		1				1	8
Moulder	5		5	1		1	4	4

Strength Analysis for 1944 (Other Ranks)								
Trades	Strength at beginning of year	Taken On Strength and/or qualified	Total Personnel Available	Struck off Strength			As At End of Year	
				To Hospitals and NETD	For Drafts and Re-musters	Total Struck off Strength	Strength	War Establishment
Painter	13	15	28	4	1	5	23	25
Panel Beaters	28	14	42	5		5	37	
Pattern Makers	3		3	1		1	2	2
Plumbers		4	4				4	4
Push Cycle Repairers	3		3		2	2	1	2
Rivetters	12	7	19	3	1	4	15	15
Saddlers	1	1	2	1		1	1	2
Sawyers	8	2	10	1	5	6	4	5
Saw Doctors		3	3	1		1	2	2
Sheet Metal Workers	24	34	58	13		13	45	44
Shoemakers	2	2	4				4	4
Tailors	1	3	4				4	4
Telecom Mechs (HAA)	13	10	23	6	8	14	9	7
Telecom Mechs (Field)	49	78	127	6	46	52	75	81

Strength Analysis for 1944 (Other Ranks)

Trades	Strength at beginning of year	Taken On Strength and/or qualified	Total Personnel Available	Struck off Strength			As At End of Year	
				To Hospitals and NETD	For Drafts and Re-musters	Total Struck off Strength	Strength	War Establish-ment
Textile Refitters	11	10	21	4	8	12	9	8
Toolmakers	9	3	12		2	2	10	16
Turners	45	43	88	18		18	70	60
Vulcanizers	54	16	70	10	46	56	14	15
Watchmakers	5	7	12	1	2	3	9	8
Welders	18	50	68	12	3	15	53	52
AA Fitter	4		4				4	
Engine Hand	1	1					1	
Typewriter Mechanics		1	1		1	1		
Clerks	63	74	137	13	35	48	89	116
Cooks	40	26	66	9	9	18	48	48
Storemen	71	148	219	30	26	56	163	149
Non-Tradesmen	476	384	860	114	247	361	499	513
Total	1,868	2,150	4,018	539	699	1,238	2,780	3,054

Production & Man-Hours

Production

The total number of items repaired in 1944 was 80% greater than in 1943. Production throughout 1944 was guided by the needs of the Canadian Army in the United Kingdom and in Europe. The addition of new equipment, the added experience, and the increase in personnel were all factors in increasing the output, and improving the quality of equipments repaired.

(For a summary of production for 1944 see Page 13).

Special Operational Commitments

In January, special preparations were made to undertake a program of waterproofing a large number of "B" vehicles and carriers for anticipated operations in Europe. This necessitated a large amount of experimental work and special training of more than 300 personnel drawn from shops not engaged on urgent priorities. A number of wading trials were conducted at Weymouth to test the reliability of waterproofing materials, methods, and procedures. Following early discouraging results, a satisfactory procedure was determined and followed through. The total number of vehicles waterproofed was:

"B" Vehicles	4,209
Carriers	429
Tanks	8
Total	4,646

This total was broken into the following groups:

Assault Force	981
Assault Reserve	284
Build-Up	3,381
Total	4,646

Reports received after landing operations in Normandy showed that Canadian waterproofed vehicles were very successful under actual landing conditions, and that only 0.15% failed due to faulty waterproofing.

Following this was the carrying out of special work necessary to tanks and S.P. mounts [guns] used by First Canadian Army for active operations as under:

Category	Modifications	Total
Quick Fix Modifications:		
Sherman III Tanks		143
Fitting of Weldware:		
Sherman Observation Post Tanks	42	
Ram Observation Post Tanks	19	

M-7 Self-propelled Gun Mounts	96	
M-10 Self-propelled Gun Mounts	72	
Sexton Self-propelled Gun Mounts	28	
Ram 17-Pounder Gun Towers	38	
General Stuarts	96	391
Conversions:		
Ram II to Observation Post Tanks	24	
Ram II to 17-Pounder Gun Towers	2	83
Wireless Installations:		
Sherman Observation Post Tanks	68	
Ram Observation Post Tanks	19	
Ram 17-Pounder Gun Towers	22	146

In addition, all of the vehicles were inspected and repairs carried out where necessary, some requiring extensive work.

In the same period that the waterproofing and special tank programs were in progress, other special job requirements were received and completed. Some of these special jobs were:

Converting 5-cwt 4 x 4 Vehicles to Ambulances	24
Converting Office Lorries to Instrument Repair Lorries	39
Installing C-33 Wireless Sets in 3-ton Lorries	28
Installing 2 KW Generators in 20-cwt Trailers	28
Manufacturing Caravans	12
Manufacturing Bomb Thrower Brackets	600

Backlog

With the movement of First Canadian Army to Europe and the completion of the programs detailed above, the efforts of the shops were devoted to reducing the backlog of non-serviceable equipment which had been evacuated by field units prior to entering active operations in Europe. The largest single item was 17,000 unserviceable “B” Vehicles. All available personnel were directed to this task, and a program was outlined to reduce this backlog. As there were only a few non-serviceable operational tanks to be repaired, a large part of the tank shop was diverted to the repair of “B” vehicles. Engine and component shops were increased in proportion, to meet the demands of the vehicle shops consequent to this program.

Production reached a peak in July, August, and September, and averaged approximately 275 “B” vehicle repairs per week. As repair requirements on other operational equipments increased, the number of “B” vehicles repaired was reduced. Until the end of the year the average was 175 per week. Throughout the program, continual emphasis was placed on priority vehicles required for operational purposes, as well as non-operational vehicles to be used in base units, thus releasing operational vehicles for active forces.

Non-serviceable minor vehicle assemblies, and instruments and wireless evacuations from the field were also quite heavy. The shops concerned put on a concentrated drive and, by the end of October, all of these items were cleaned up.

The engine and assembly shops had, prior to the beginning of 1944, reduced the non-serviceable stocks, and, as the evacuations from the field were not great, there was very little backlog to be considered.

Special Work for North-west Europe Forces

The need for special types of armoured vehicles was considered shortly after the Canadian Army landed in Europe. A large number of personnel carriers, ammunition carriers and flame throwers, converted from Ram II tanks were required. The original commitment called for 226 of such conversions, this later being increased to 306. The following conversions, by types, were completed:

Armoured Ammunition Carriers	90
Armoured Personnel Carriers	180
Flame Throwers	36
Total	306

In addition to these requirements, 59 Ram II Tanks were converted into 17-pounder anti-tank gun towers, and at a later date, a further modification was completed to make these vehicles suitable as personnel carriers [Kangaroos]. For these tank conversions, a considerable quantity of fittings was manufactured and the majority of these tanks required heavy repairs to make them serviceable.

Several other special jobs originated from operational theatres, and demands were made on these workshops for the completion of these items within a limited time. Some of these jobs were:

Manufacturing Browning [MG] Splash Shields for Sherman Tanks	200
Manufacturing Grenade Projectors	200
Modifying “Land Mattresses” [Multiple Rocket Launchers]	14
Fitting Booms on 40-ton Tractors	20
Changing Coles Cranes from Austin to Diamond T Chassis	11

Unserviceable Equipment Received from NWE

Early in 1944, shop production was planned on a basis of the estimated flow of unserviceable assemblies from operations, being assumed that all Canadian evacuations [of equipment] would be the responsibility of these workshops. After actual operations had progressed in Europe, this plan was found to be unsatisfactory. Considerable difficulties were encountered by British inward depots in determining which assemblies originated from Canadian units. Also, the great varieties of components returning in limited numbers resulted in un-economical repair practices. A policy was therefore agreed that these workshops assume responsibility to repair a definite quota of limited types of assemblies. Similarly, all other items returned from Canadian units in Europe were to be considered as part of a general pool to be repaired in British workshops.

The receipt of non-serviceable assemblies from Europe was small until early in November. During November and December the flow increased rapidly. The following table shows the number of assemblies up to the end of 1944 received and repaired since the invasion of Europe:

	Received	Repaired & Returned
"B" Vehicle Engine Assemblies	793	505
"A" Engines - Continental	321	218
"A" Engines - Chrysler	65	53
Other "A" Engines	26	19
"B" Vehicle Components	340	219
Miscellaneous Other Items	144	129
	1,689	1,143

With the exception of engines and vehicle assemblies, no other types of equipments have been received from Europe in quantity. Only three tanks have so far been detailed to these workshops, the main reason for this being that the capacity of the shop was reached in converting and repairing the balance of the Ram II tanks. Instrument and wireless equipments in need of repairs are drawn from unserviceable pools existing at British depots. Small arms are not reaching the unit, and action has been instigated to reduce the size of this shop. This also applies to armament and consideration is being given to a revision in this department.

Other Repair Commitments

C.R.U. repair requirements increased during 1944, particularly on vehicle assemblies. Apparently, this was due to the increased training programs within the reinforcement units.

The additional requirement for motorcycle and motorcycle assembly repairs, with the Harley-Davidson being made operational, necessitated increasing this shop. In November, a weekly repair requirement of 40 motorcycles, 56 engines and 10 gear boxes was set as a quota. Although this commitment was not met by the end of the year, it was anticipated that it would be reached within another two or three weeks.

Several of the smaller shops, such as radiator and battery, were expanded to meet requirements due to increased vehicle repairs.

The vulcanizing shop was reduced to 25% of its original man-power during November, releasing 46 personnel for the forming of two mobile tire repair units, which proceeded to NWE to serve the Canadian Army.

Inventive Aids to Production

Many original designs of machines and jigs have been developed to improve both speed and quality of production in the various shops. A few of the outstanding items designed and manufactured during the last year are described below.

Two centrifugal connecting rod re-metalling machines were manufactured and put into use for pouring Chevrolet engine rod bearings. This machine has a capacity of one connecting rod bearing per minute compared with five minutes each by the hand-poured method. Also, the centrifugal effect gives a more compact metal in the bearing. Two additional machines were manufactured for British workshops, as well as one for a Canadian Advance Base Workshop in Europe.

An air-operated machine for disassembling and reconditioning tank track support rollers was developed, and has resulted in a large saving in time and material. The disassembly time was reduced from 1.7 to 0.17 manhours. With hand tools, damage resulted in disassembly to some of the components in rollers that were badly rusted and seized. The air machine is sufficiently powerful to disassemble practically all rollers.

Among the many mechanical developments in the electrical components shop, mention is made of; a distributor test bench fitted with a universal drive for all types of distributors, giving greater accuracy in setting the points by voltmeter readings instead of feelers; a carburettor test bench on which all jets as well as the complete carburettors are tested by air flow gauges, giving greater reliability; and a self-aligning clamping fixture, for fitting generators to the test benches, that saves considerable time.

In the instrument shop, a rangefinder collimator was designed whereby these instruments could be calibrated irrespective of weather conditions. A watch comparator is also in the final stage of completion. This electrical device operates on the cathode ray oscillograph principle, and permits instantaneous comparison of watch timing against a standard master time.

Spare Parts

Spare parts supplies, though improved, were still insufficient to keep up with our requirements. It was necessary to develop new and extended methods of reclaiming non-serviceable parts and to increase the manufacture of a limited number of items.

Man-Hours

The productive man-hours per unit remained at approximately the level of 1943, although the efficiency of the shop was influenced considerably by the preparation for special programs, the increased reclaiming operations, and the great turnover of personnel. (Refer to Comparative Table on Page 15).

Shop overhead, despite the added requirement of personnel for spare parts group, the addition of an R.S.G. and an expense stores, remained at a favourable level. Shop maintenance and installation was also increased considerably in 1944.

Non-productive man-hours, other than shop overhead, show a decided improvement. A good part of this improvement was, however, due to the urgent work programs and the resultant decrease in man-hours normally allowed for non-productive duties, i.e. regimental training and leaves. All productive, overhead and non-productive activities are based on a working week of 48 hours.

A breakdown of the man-hours for 1944, in comparison with 1943, is given in the table below:

	1944		1943	
	Man-hours	%	Man-hours	%
Employed on Productive Work	3,130,156	54.3%	1,875,283	44.3%
Employed on Shop Overhead	854,435	14.8%	611,937	14.5%
Total Employed at Workshop	3,984,591	69.1%	2,487,220	58.8%
Regimental Employment	944,584	16.3%	776,563	18.4%
Courses and Training	312,064	5.4%	385,163	9.1%
Away from Unit	395,955	6.8%	416,210	9.8%
Unemployables	122,515	2.1%	154,554	3.6%
Miscellaneous	19,488	0.3%	10,119	0.3%
Total	5,779,197	100%	4,229,829	100%

Production and Backlog Comparisons, 1944 - 1943

	1944		1943	
	Completions	Backlog	Completions	Backlog
Tanks and SP Mounts	2,380	366	1,599	230
Wheeled “A” Vehicles	735	200	508	192
“B” Vehicles	7,899	2,220	5,055	742
“B” Vehicles Waterproofing	4,646			
Motorcycles	407	2,637	2,813	699
Continental Engines	1,539	300	771	225
“A” Engines Other and HD Diesel	174	46	19	1
“B” Engines	8,981	893	6,053	295
“A” components	15,558	264	7,961	609
“B” Mechanical Components	9,636	1,175	6,504	599

	1944		1943	
	Completions	Backlog	Completions	Backlog
“B” Miscellaneous Components	28,888	1,049	12,385	311
Motorcycle Assemblies	3,091	648	3,182	949
Electrical Components	124,751	1,905	65,912	769
Armament	1,613	21	1,748	26
Small Arms	24,997	2,834	10,647	411
Telecommunications	38,79177	1,648	11,144	1,723
Radio	11,190		37	
Instruments	22,506	835	8,361	462
Machine Shops	24,422	302	25,189	874
Carpenter Shop	7,454		15,391	
Blacksmith Shop	2,916		2,823	
Welding Shop	3,841		2,385	
Sheet Metal Shop and Radiators	8,754	159	2,803	
Textile Shop	2,457		3,963	
Paint Shop	758			
Foundry	934			
Total	353,395	17,502	199,550	9,117

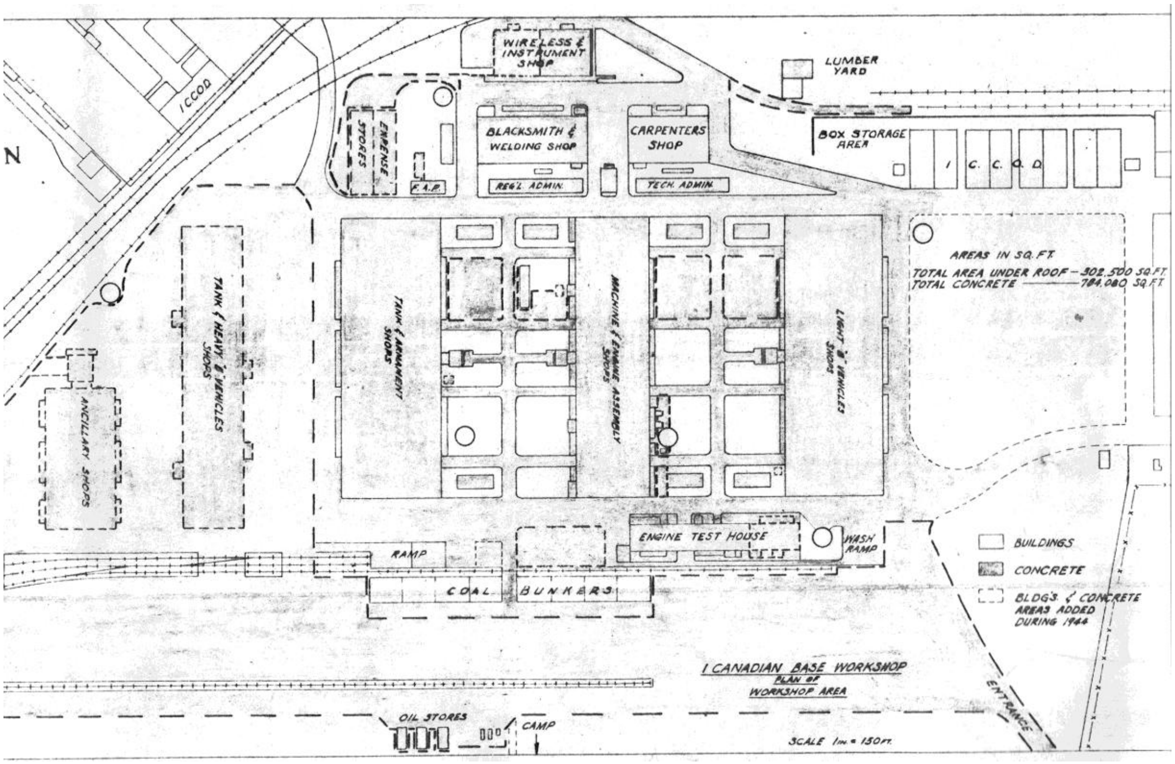
Comparison of Production and Manhours

	Production		Average Man-hours per unit within main shop		Total Man-hours per unit (includes all ancillary and subsidiary work)	
	1944	1943	1944	1943	1944	1943
Tanks and SP Mounts (including modifications)	1,090	544	284.2	243.0	475.2	488.2
Wheeled "A" Vehicles and Carriers	735	408	123.0	163.0	182.3	194.6
"B" Vehicles (repairs)	7,899	5,055	83.6	62.5	132.4	91.6
"B" Vehicles (Wpg)	4,646		45.1		45.1	
Motorcycles	407	2,813	51.5	35.5	63.7	43.0
Continental	1,539	771	112.4	151.0	184.9	231.2
"A" Engines – others HD Diesel	174	19	211.4		285.8	
"B" Engines	8,981	6,053	22.7	24.4	41.3	41.7
"A" Components	15,558		0.6	1.0	0.6	
"B" Mechanical Components	9,636	6,504	6.1	9.5	12.8	13.1
Miscellaneous Components	22,908	12,385	0.5	0.8	0.5	0.8
Motorcycle Assemblies	3,091	3,182	3.7	5.3	5.5	6.0
Electrical Components	124,771	65,918	1.1	1.1	1.2	1.3
Armament	1,613	1,784	17.7	44.0	21.3	52.5
Small Arms	26,367	10,647	1.1	1.75	1.1	1.75
Telecommunications	38,791	11,144	4.3	7.1	4.6	7.3
Radio	77	37	163.0	600.0	167.2	602.0
Instruments	11,190	8,361	11.0	9.3	11.3	11.4
Tires and Tubes	22,506	25,119	1.9	2.25	1.9	2.25

Shop Layout and Equipment

RCE Construction

During 1944 an extensive expansion program was completed by the RCE [Royal Canadian engineers]. This included the erection of new buildings, extensions to several existing buildings and the addition of concreted space within the shop area. Additional concreted areas included new roads within the shop compound as well as a new road from the shop area to the main highway. The total gain in shop space was 85,800 square feet [7,970.8 sq metres], and the additional concreted area was 465,700 sq ft [43,263 sq metres]. The majority of this engineer work was under way in 1943, but was not completed until 1944, other than the new tank building completed prior to the first of the year and used by No. 1 C.E.A.U. It was not until April that this building was taken over by the workshops. In addition to the new work done by the RCE, numerous minor jobs were required of them to improve existing facilities, and to keep in repair the roads, concreted areas, and buildings in use. This included the erection of retaining walls, small petrol storage houses, etc. (Refer to layout of shop areas below).



In addition to the new tank building, No.1 Ancillary Building was occupied in February, with the electrical components, textile, small arms, radiator, radar, and vulcanizing shops moving from their existing locations.

The wireless and instrument shop extension was completed and occupied in January. The internal shop layouts were changed to conform to the new building arrangement, and included the construction of six test cages in the wireless shops. The added areas within the instrument shop were used to segregate the machine and meter repair section from the field instruments. The optical and watch repair sections were also separated.

Re-arrangements and Relocations.

With the increased space available, and considering the expected flow of work, shop re-arrangements and expansions proceeded. The movement of electrical components to the new ancillary building made available additional space for the carpenter shop. This made it possible for a more efficient lay-out as well as additional machinery and equipment. Likewise, with the moving of the radiator shop, additional space was made available for the welding and sheet metal shops.

Reduction was made in space occupied by the Continental engine line to make room for the repair of Chrysler Multi-Bank engines. A night shift was employed to maintain the production level of Continental engines.

Numerous minor changes in the "B" engine line were made. This concerned mainly the internal re-arrangements, and addition of equipment.

The expansion and re-arrangement of the engine test house was an important feature of the expansion program. Due to the increase in engine assemblies, it was necessary to expand the testing facilities by the addition of new dynamometer and fan brakes test stands. The extensive preservation and packing requirements for overseas shipment made it necessary to occupy a section in the light "B" vehicle building, in order to provide sufficient space to carry out this work properly.

In the early part of 1944, very little motorcycle and motorcycle assembly repairs were being done. Commencing in July, C.R.U. requirements were such that it was necessary to set up a small shop for these repairs. Sufficient space was found in the new ancillary building. With the increased demands towards the end of the year, it became necessary to enlarge the shop and space was made available in the light "B" vehicle building. By the end of the year, this shop had been moved and was rapidly approaching the required output.

During 1944, the lay-out of the machine shop was greatly improved and a number of new machines were installed. A new department was set up in this shop for the inspection of roller and ball bearings and has been valuable in saving many of these parts.

Equipment Installed

Throughout 1944 a considerable amount of new equipment was received and installed. Some of the machinery received was originally ordered when the unit was being mobilized. Other machinery was ordered throughout the year to assist in meeting the requirements for the engine and component assembly lines. Most of the equipment received has, at years' end, been installed and is in use. The balance is held in stores, pending the completion of the expansion programs in the shops concerned.

Listed below are the more important items received for the various shops during 1944:

Vehicle Shops

Machines, Sanding	3
Machines, Grinding	1
Outfit Cutting Triplex Glass	1
Pump High Lift	1
Tanks Pressure Feed	3
Test Sets Portable Elect	1
Tester Ignition Type C	4

Engines, Components & Engine Test	
Machines, Grinding	16
Machines, Head Polishing	4
Machines, Honing Cylinder	3
Machines, Rebabbiting Conrod	1
Machines, Relining Brake	4
Machines, Screwdriver	1
Machines, Boring	10
Machines, Connecting Rod Aligner	3
Machines, Valve Seat	6
Plant Visca Cooling Unit	1
Plants Water Cooler	2
Dynamometer Hydraulic	2
Flexible Shaft Grinder	12
Runmen Cylinder Hone	6
Sioux Wet Grinding Attachment	2
Machine Shop	
Machines, Grinding	3
Machines, Milling	1
Machines, Tester Static	1
Ancillary Shops	
Machines, Punching & Shearing	1
Machines, Screwdriver	3
Machines, Band, Resaw	1
Machines, Bending Roller & Pipe Forming	1
Spark Plug Cleaner & Tester	2
Test Set Diesel Engine Atomizer	1
Machines, 416 Gauge, Elect Shear	2
Wireless Shops	
Bridges Capacity & Resistance	4
Hickock Crystal Generator	1
Frequency Meter	1
Instrument Testing Avometer	1
Oscillographs	1

Oscillators Beat Frequency	2
Voltmeter Valve	4

Instrument Shops

Apparatus Log Measuring	1
Apparatus Magnetising Compass Needles	1
Collimators Compass Mk. I	1
Lathe Watchmakers L.D.	2
Machines, Grinding	2

General

Machines, Drilling	51
Machines, Grinding	33
Plants Washing Hydra Force	3
Plants Welding & Cutting	12
Plants Welding Electric	13
Porta Power Equipment Hydraulic	13
Wrenches Impact	143

R.S.D.

Trucks Industrial - Douglas	7
Electric Loca Crane Truck	1
Hyster Karry Crane Cdn	2
Tractor Industrial	1

Summary and Forecast

Most of the shops are considered satisfactory for the amount and and type of work that it is estimated will be demanded of this unit. Changes planned for 1945 concern mainly the assembly lines.

It is proposed to reduce the space for light “B” vehicle overhauls and to move into this space three of the smaller assembly shops. The moving of the mechanical components shop (axles, transmissions, and transfer cases) from the present shop space will make room for the expansion of the “B” engine line to 400 overhauls per week on a single shift. By moving the Chrysler Multi-Bank line together with the static engine repair shop, it will be possible to increase the number of repairs on these items as well as provide additional space for Continental engines. This is necessary in order to realize the requirement of 70 Continental engines per week. It is expected that additional space will be required for the weatherproofing and packing of engines, in view of the additional work necessary to meet field requirements.

One other move contemplated is the maintenance and miscellaneous repair section, which at present is located in the machine shop. In view of the expansion of this department it will be necessary to provide additional shop space. None being available in the machine shop, it is proposed to move this department to the new ancillary building.

Safety and Fire Protection

Accident Frequencies

During 1944 every effort was made to ensure that all personnel in the shops were “safety conscious” and it is considered that our efforts have shown results. While there are no figures to compare for 1943, during 1944 only 831 accidents of all types were handled by the medical staff, of which 15 were considered serious. On the average, an accident occurred each 5,000 shop hours. Serious accidents, which cover all types of accidents that may result in a permanent injury, such as a lacerated finger, broken bones etc., only occurred on an average of once each 265,000 shop man-hours. Injuries, such as cuts and scratches were most numerous, approximately 40% of all accidents. Eye accidents, mostly foreign particles, were next, and covered approximately 30% of all accidents.

The following is a summary of accidents at 1 Canadian Base Workshop during 1944.

Causes of Accidents

Causes	Total 1944
Hand Tools	188
Power Tools	197
Vehicles & Tank Bodies	68
Handling of Parts & Assys	85
Handling Other Materials	79
Falls & Falling Material	60
Inflammables	44
Unclassified	130
Total Accidents	757

Types of Accidents

Types	
Hands - Cuts, Sprains, etc.	350
Eyes	271
Burns	34
Others	181
Serious Accidents	15
Total	851

A first aid post centrally located in the workshop area was equipped with adequate facilities. A medical officer was on duty during the day with two orderlies trained in first aid. Medical orderlies were retained in this F.A.P. during the night to serve the night shift personnel.

Fire Protection

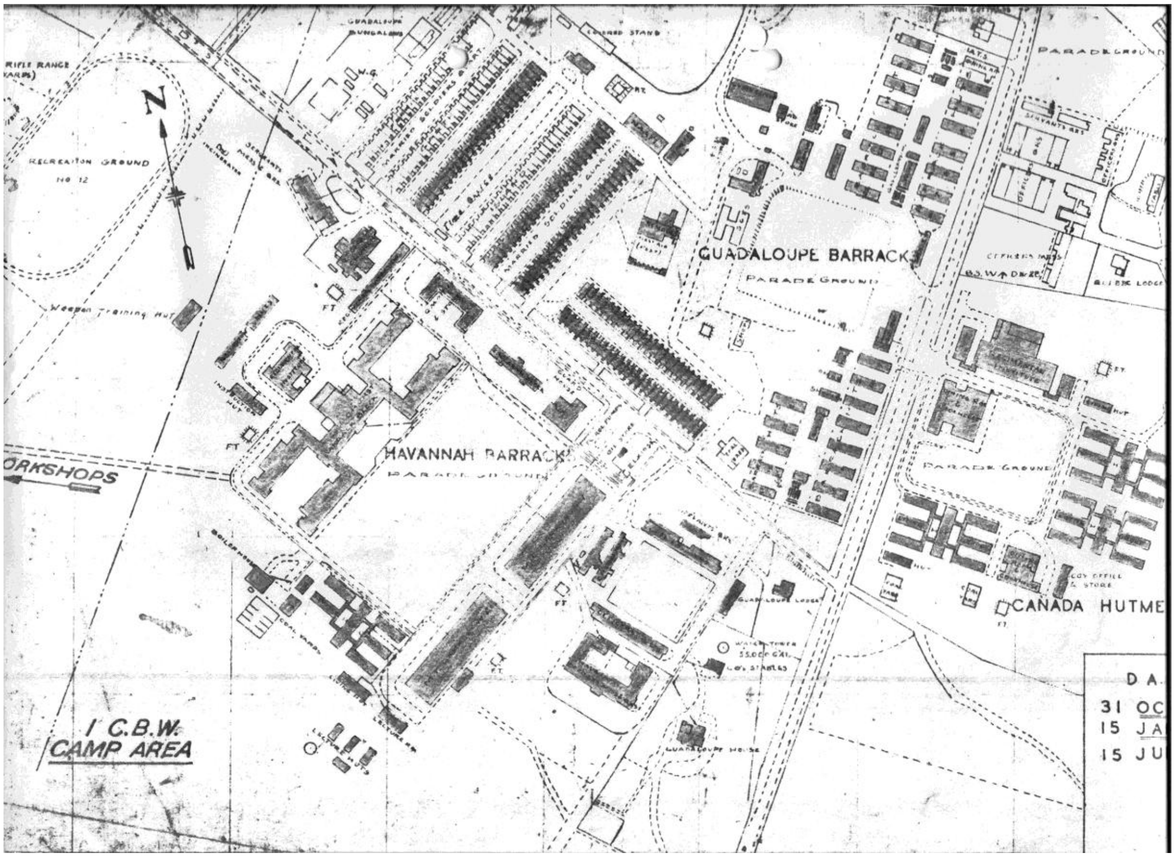
Firefighting facilities were studied during 1944 for the purpose of eliminating, as far as possible, all fire hazards. Considering the value of the equipment and buildings in the workshop, it was decided to have a committee of civilian fire inspectors as well as army fire experts visit the shops and submit their recommendations. The suggestions made were complied with, resulting in a large increase in firefighting equipment and the enforcement of strict compliance to fire hazard instructions. Various wood structures were lined internally and externally with fireproof materials. Steps were taken to segregate bulk storage of petrol, oil, and paint from the main building. Among the recommendations which have been carried out was the construction of a 200,000 gallon [908,000 litres] static water tank in addition to the six of 12,500 gallons [56,750 litres] capacity existing within the shop area. Firefighting facilities and equipment were inspected weekly and all defects were corrected immediately.

Unit Administration, Welfare and Recreation

The Regimental Administration Group was responsible for all unit functions other than shop duties. The main responsibilities were supervision of camp areas, messes, and unit services.

Accommodation

Due to the increase in unit strength, additional barrack accommodation was required. Havannah Barracks, in close proximity to the workshop, were taken over. These barracks, built in 1939, are very comfortable and capable of housing over 1,200 other ranks. This made it possible to move a large number of men from the old Guadalupe Married Quarters, and provided for the increasing number of reinforcements. A plan of the camp area is shown below indicating the buildings held at the end of the year.



Two men’s messes were operated during 1944. On taking over Havannah Barracks, one of the two messes at Canada Hutments was closed, and the Havannah Mess, with larger capacity was put into use. The number of men on night shifts at the workshops necessitated the operating of these messes on a 24-hour basis. The mid-day meal was served at the shops, food being prepared at the messes and sent in containers. Similarly, one meal was provided at the shops for night shift personnel.

Welfare

Everything possible was done for the welfare of the men. This included a welfare department which was under the supervision of the padre. Certain trained personnel were allotted to this department to assist.

Assistance was given to personnel with domestic and business problems and legal advice was available. For those interested in improving their education, experienced teachers were provided to conduct classes in varying subjects and arrangements had been made to attend schools in the vicinity. In addition, correspondence courses available through the Canadian Army Educational Service were encouraged.

Recreational Facilities

Three canteens were operated by NAAFI for the benefit of creational the UNIT. All of these institutes were equipped with recreational facilities and writing room facilities.

Two sports grounds are located in the camp area. In addition, the extensive Bordon area playing fields are immediately adjacent to the camp. A gymnasium is included with the camp facilities. Games rooms in the NAAFI's were under the supervision of the auxiliary officers, who were responsible for the provision of equipment and supplies.

Cinemas

Two films were shown weekly, each being given five runs - two for men on day shifts, one for those on nights, one in the sergeants mess and one in the officers mess. In addition there are two privately operated cinemas in the Bordon area, which are open afternoons and evenings.

Shows

ENSA provided two variety shows each week, suitable stage facilities being available in two of the NAAFI canteens. When Units of the Canadian Army Shows entertained, they replaced an ENSA show. A garrison theatre also operated in this area, performances being presented nightly, Sunday excluded.

Dances

Dances were held weekly in the gymnasium, which accommodated approximately 250 men and partners. Distribution of tickets was made by company rotation to ensure that all had an opportunity to attend over a period of time. Sergeants and officers messes held dances monthly. Normally an orchestra consisting of members of this unit supplied music for these functions.

Trips

Various conducted recreational and educational tours were arranged for week-ends with the assistance of the padres and auxiliary service officers. These have included trips to Winchester Cathedral, Tower of London, Naval Installations, etc.

Inter-unit Sports

This Unit participated actively in all Canadian Army sports programs. Unit baseball, softball, basketball, hockey, tennis and boxing teams made good showings during the past year. The tug-of-war team won the General McNaughton Cup as Canadian Army Champions for 1944. The hockey team was one of the Canadian teams selected to play exhibition games in Scotland. At end of the year they had not met with any reverses.

Unit Sports

Everyone was encouraged to participate in Unit sports and competitions. These varied with the season and were a source of enjoyment and interest to the men. All companies had teams with schedules drawn up accordingly. During 1944, Inter-company sports competitions included softball, basketball, tennis, soccer, volley ball and floor hockey.

Unit Field Day

A unit field day was held on Labour Day and was quite a success in spite of the very wet weather. All events possible were run, the individuals and teams showing a commendable sporting spirit. The Commander of C.R.U. and other high ranking officers attended and presented prizes.

Funds

The unit at end of 1944 possessed a total of £2,676 as surpluses in the various accounts. The amount of money handled was large, due to the size of the unit. The various funds, income and expenditures for 1944 are listed below:

	Receipts	Expenditures	Surplus as at 31 Dec 44
Regimental Fund	£ 4,465	£ 3,755	£ 1,578
Men's Messing Fund	9,730	9,730	-
Barrack Damages	58	76	88
Sergeants Mess	12,192	12,262	217
Officers Mess	9,00	9,073	793
	£ 35,449	£ 34,896	£ 2,676

Victory Loan Campaign

Two Canadian Victory Loan Campaigns were conducted during 1944 and were very successful. The total of money subscribed was:

VI	Victory Loan	65,950.00
VII	Victory Loan	89,900.00

Both of these Victory Loan subscriptions were over the quota for this unit, the 6th Victory Loan being 80% and 7th 91% over the target.

Unit Newspaper

A unit newspaper was published weekly, the editorial staff consisting of representatives from each of the companies. Articles, covering shop activities, social events, and general information affecting the men's welfare, were encouraged. This paper created great interest among the personnel and was utilized as a means of keeping the men informed on unit matters of general interest.

Public Address System

A unit public address system was installed during 1944 in all of the shops and camp areas. News broadcasts were made during the morning “break” period, and music played during the meal hour at the shops. This was also used as a means of keeping the personnel informed of all activities.

The facilities and activities mentioned have helped considerably in keeping personnel contented and have been the source of eliminating many of the personnel difficulties encountered.

Photo Appendix

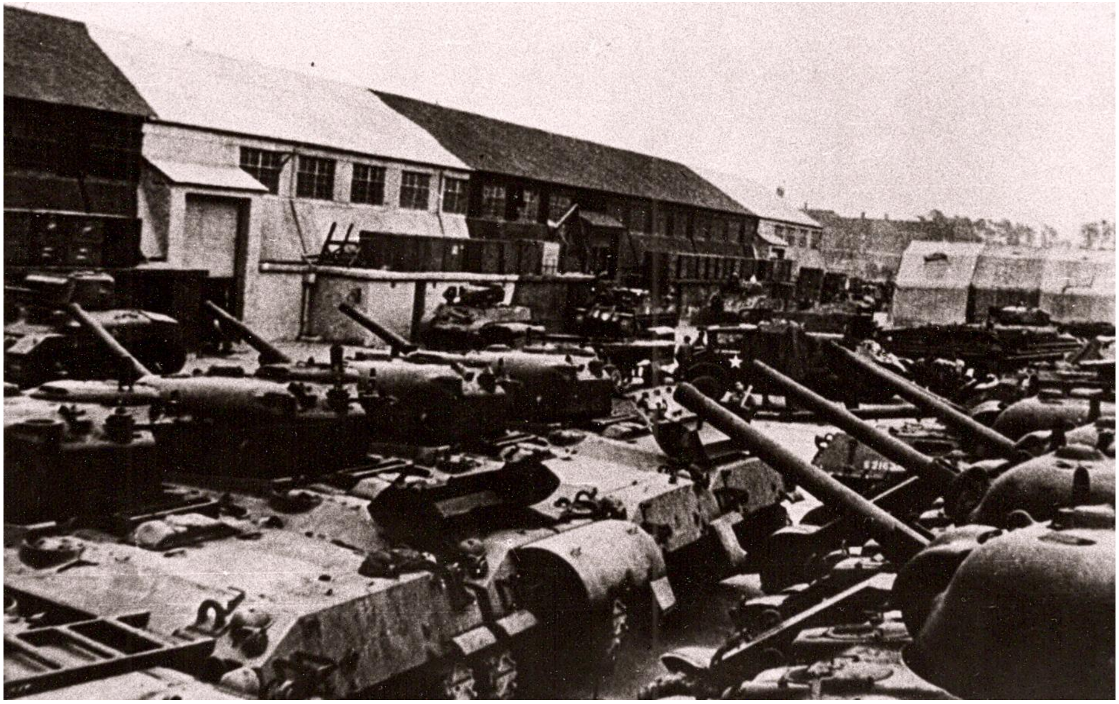


Figure 1 - A Vehicles

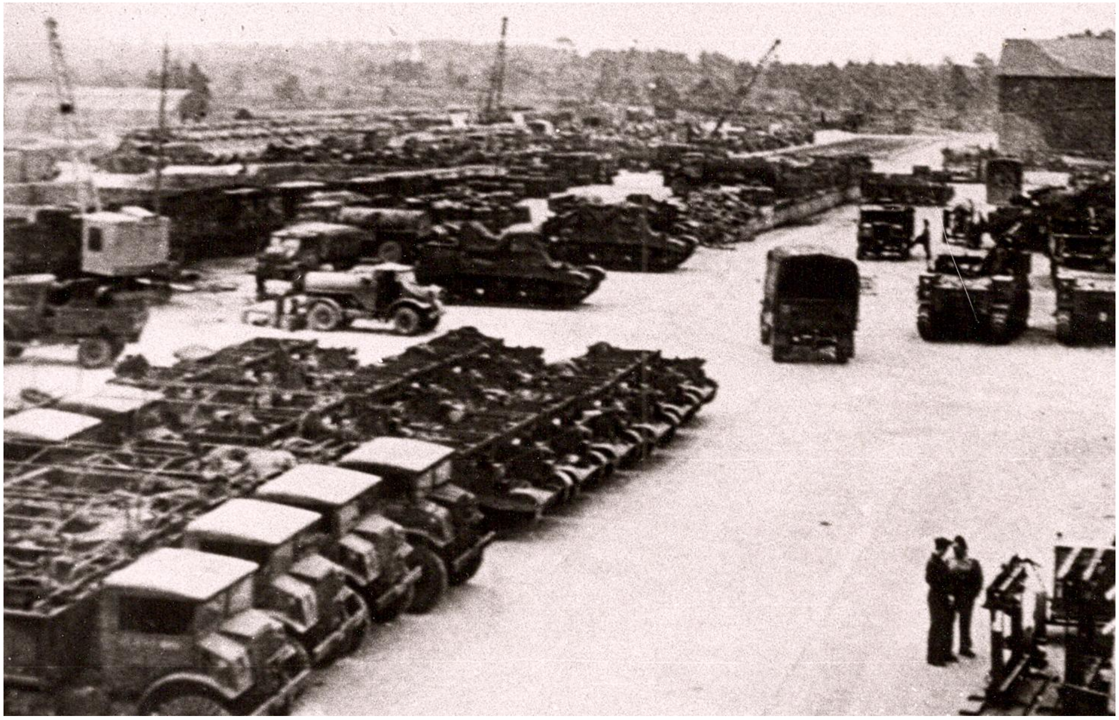


Figure 2 - B Vehicles and Carriers

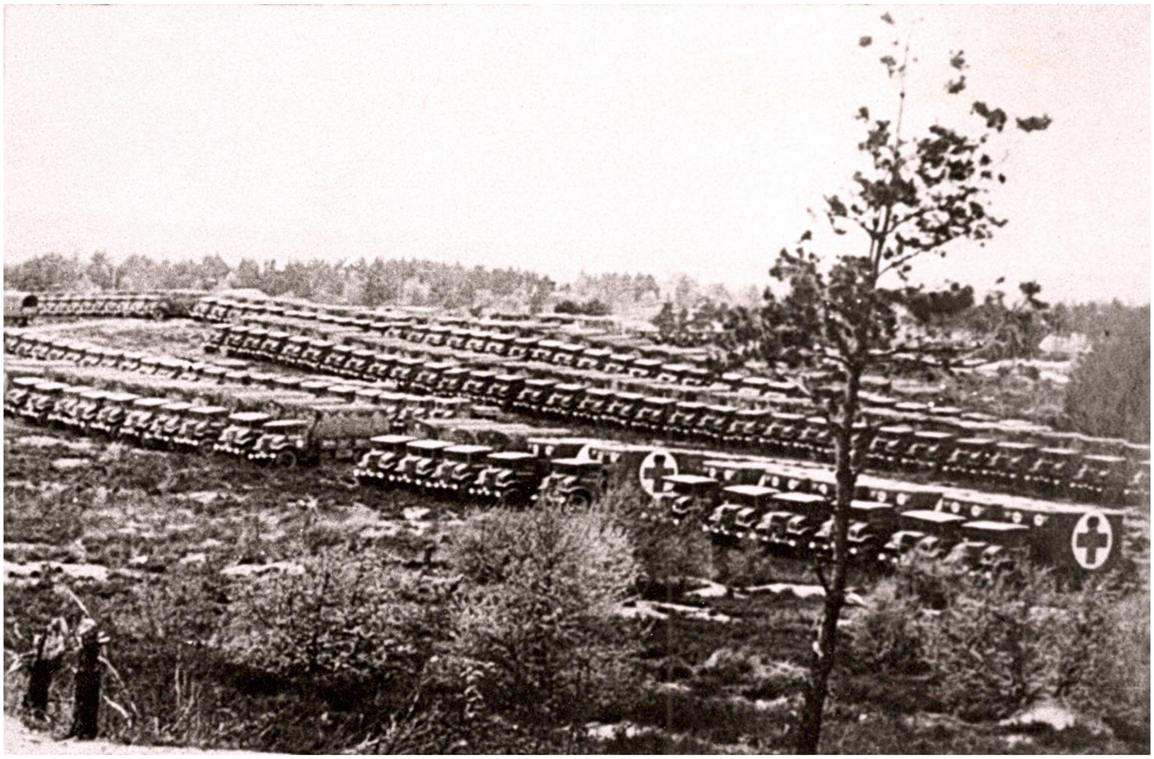


Figure 3 - CMP Vehicles

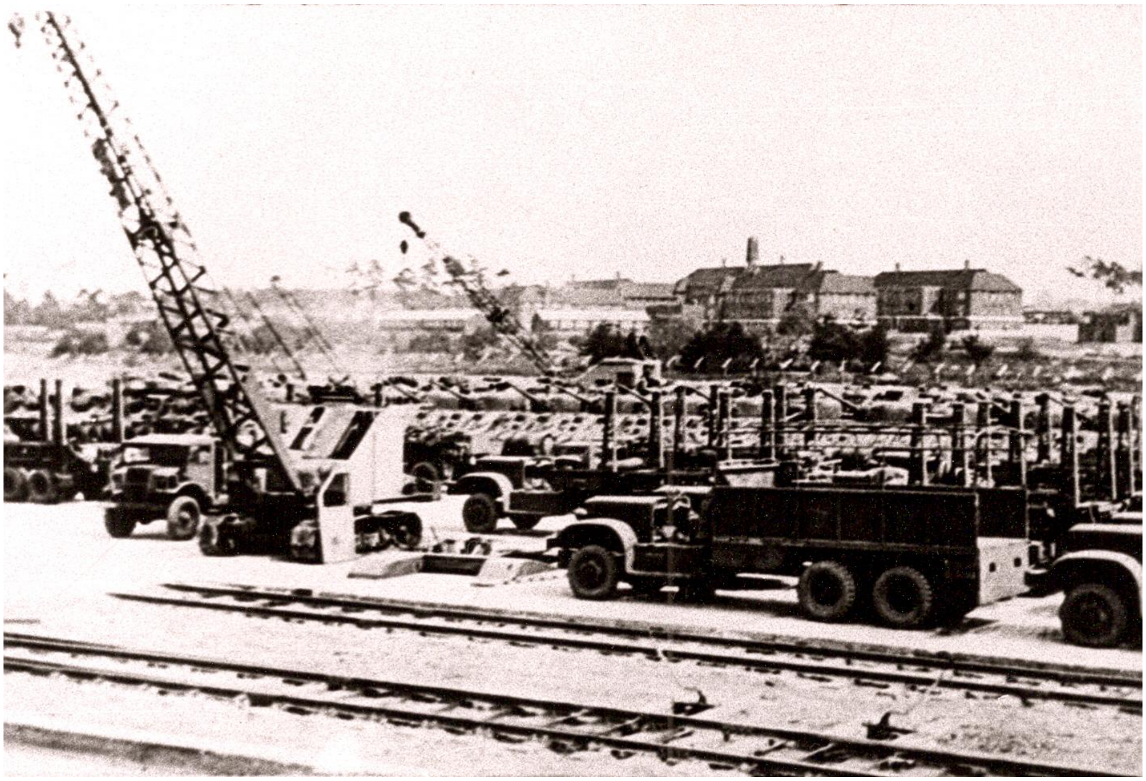


Figure 4 - Havannah Barracks in Background

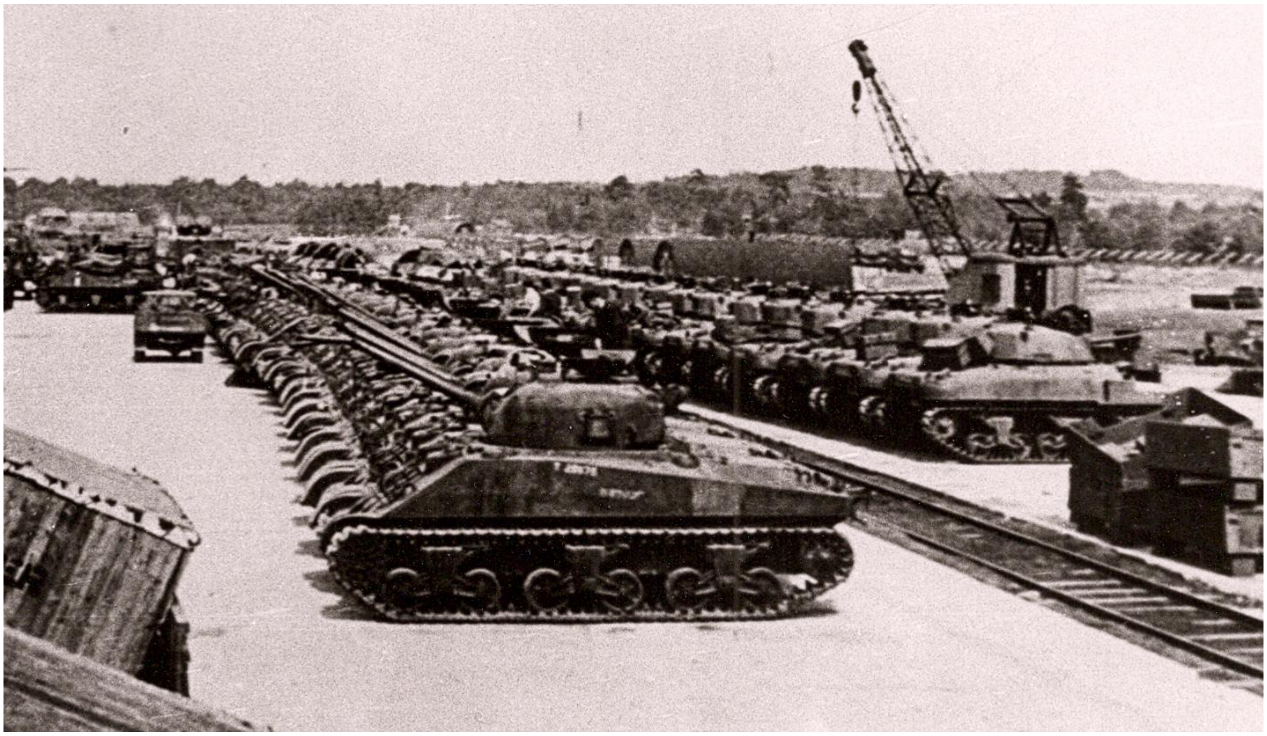


Figure 5 - Sherman Tank Lines

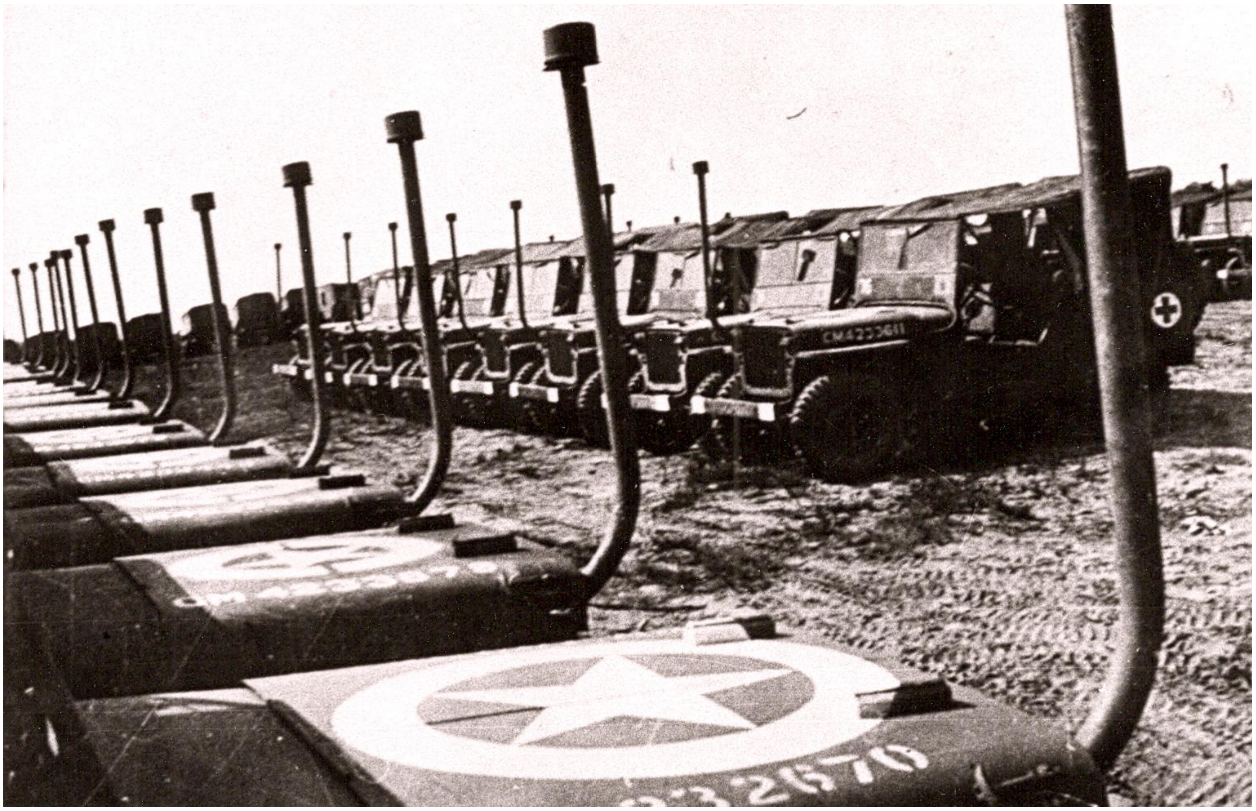
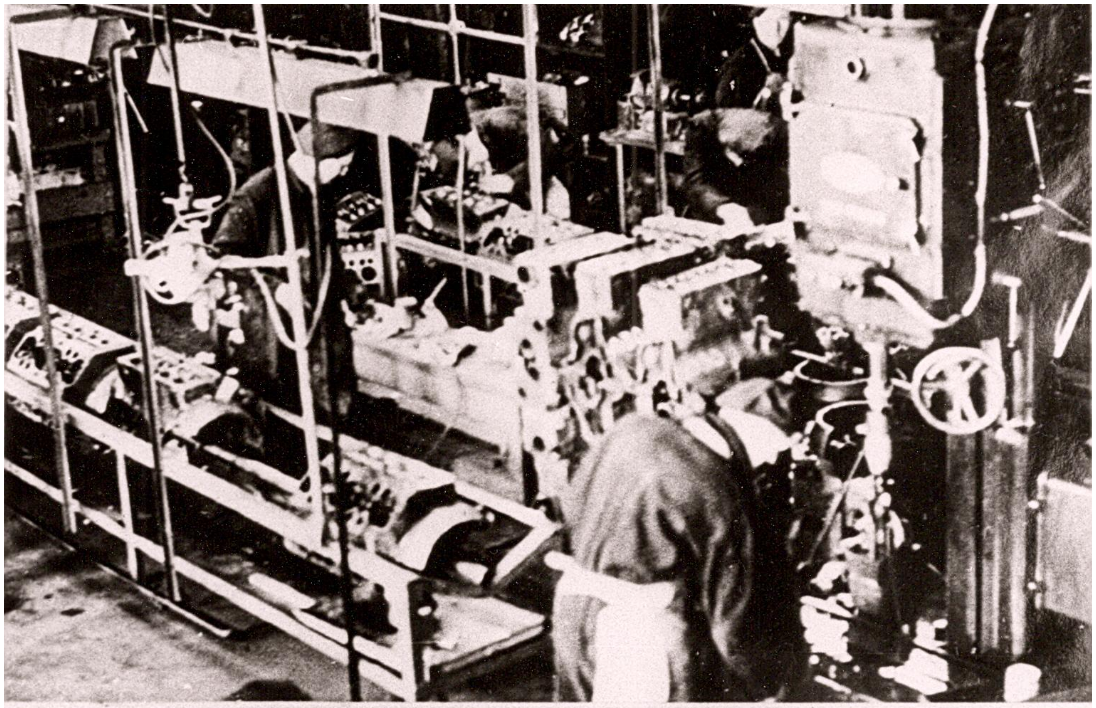
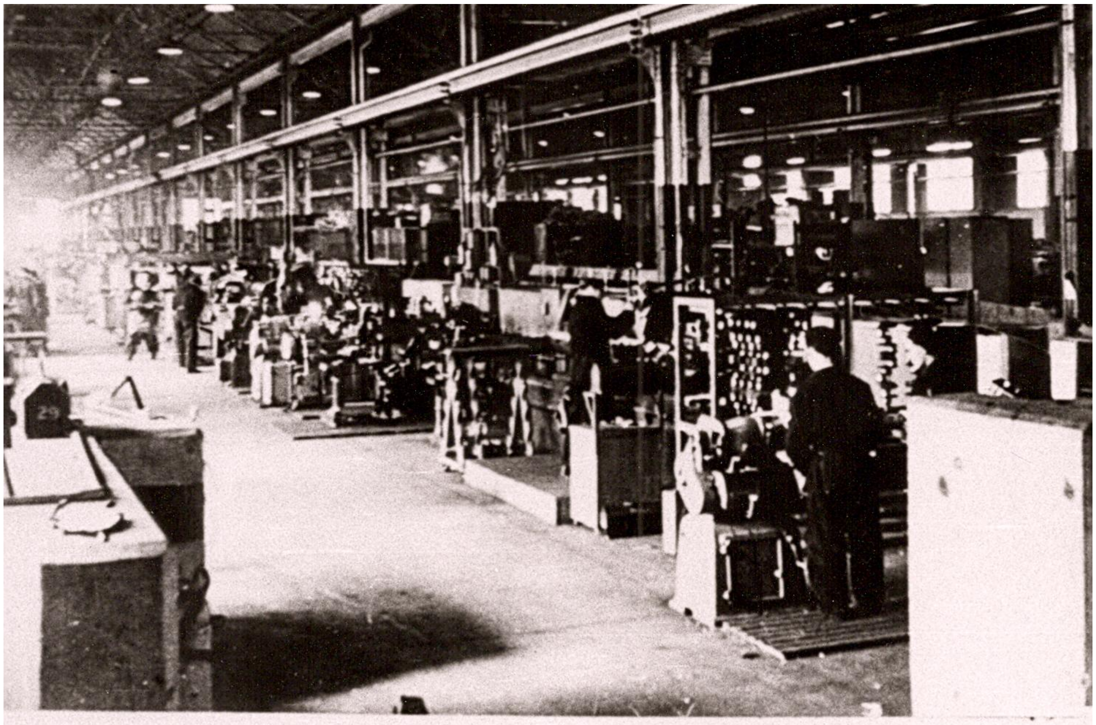


Figure 6 - Waterproofed Jeeps

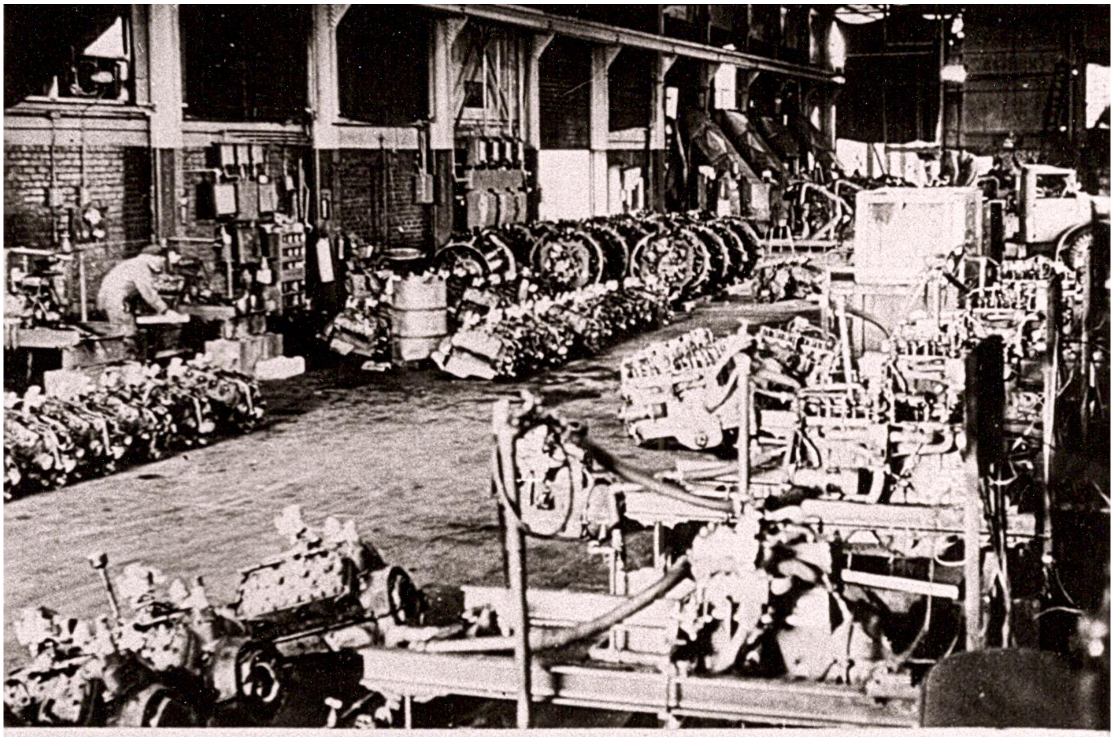


"B" ENGINE RECONDITIONING SHOP



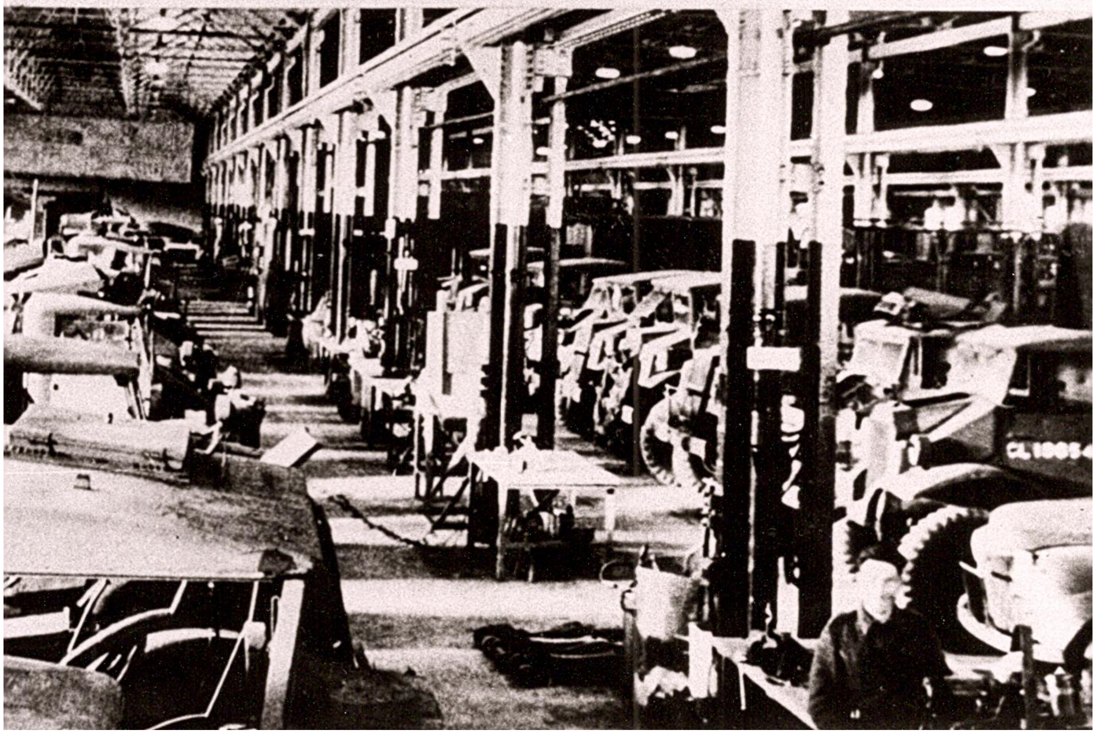
MACHINE SHOP

WIRELESS SHOP



ENGINE TEST

LIGHT "B" VEHICLE SHOP



TANK SHOP